

THE SUSTAINMENT FORCE STRUCTURE EVOLUTION FROM THE
ARMY OF EXCELLENCE TO THE MODULAR FORCE

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE
General Studies

by

TIMOTHY M. ADAIR, MAJOR, U.S. ARMY
B.A., John Carroll University, University Heights, Ohio, 2003

Fort Leavenworth, Kansas
2013-02

Approved for public release; distribution is unlimited.

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 13-12-2013		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) FEB 2013 – DEC 2013	
4. TITLE AND SUBTITLE The Sustainment Force Structure Evolution from the Army of Excellence to the Modular Force				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Major Timothy M. Adair				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) U.S. Army Command and General Staff College ATTN: ATZL-SWD-GD Fort Leavenworth, KS 66027-2301				8. PERFORMING ORG REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution is Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT As the Army transitioned from an Army of Excellence force structure to the modular force structure many changes were necessary. One of the most critical changes that was made in order to ensure seamless logistical support is the sustainment structure. Over the past few decades the Army has been engaged in several conflicts that tested both models of sustainment force structures against different types of threats. In Operation Desert Storm it was a near peer threat or a conventional force. In Operation Enduring Freedom and Operation Iraqi Freedom it was a hybrid threat. After over a decade of war there is no doubt the Army has gotten used to supporting the hybrid threat. This research will focus on which sustainment force structure will better support combat operations should the Army face another near peer threat in the future. This research will specifically focus on the two types of sustainment force structures and how they support the Army's doctrine for Unified Land Operations.					
15. SUBJECT TERMS Sustainment Force Structure, Modular Logistics					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT (U)	18. NUMBER OF PAGES 59	19a. NAME OF RESPONSIBLE PERSON
a. REPORT (U)	b. ABSTRACT (U)	c. THIS PAGE (U)			19b. PHONE NUMBER (include area code)

MASTER OF MILITARY ART AND SCIENCE
THESIS APPROVAL PAGE

Name of Candidate: Major Timothy M. Adair

Thesis Title: The Sustainment Force Structure Evolution from the Army of Excellence
to the Modular Force

Approved by:

_____, Thesis Committee Chair
Jeffrey G. Vanwey, M.S.

_____, Member
O. Shawn Cupp, Ph.D.

_____, Member
Don A. Myer, M.S.

Accepted this 13th day of December 2013 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE SUSTAINMENT FORCE STRUCTURE EVOLUTION FROM THE ARMY OF EXCELLENCE TO THE MODULAR FORCE, by Timothy Adair, 59 pages.

As the Army transitioned from an Army of Excellence force structure to the modular force structure many changes were necessary. One of the most critical changes that was made in order to ensure seamless logistical support is the sustainment structure. Over the past few decades the Army has been engaged in several conflicts that tested both models of sustainment force structures against different types of threats. In Operation Desert Storm it was a near peer threat or a conventional force. In Operation Enduring Freedom and Operation Iraqi Freedom it was a hybrid threat. After over a decade of war there is no doubt the Army has gotten used to supporting the hybrid threat. This research will focus on which sustainment force structure will better support combat operations should the Army face another near peer threat in the future. This research will specifically focus on the two types of sustainment force structures and how they support the Army's doctrine for Unified Land Operations.

ACKNOWLEDGMENTS

The time, effort, and dedication that went into this research project were not mine alone. I would like to thank my wife for the countless hours she has spent raising our three children while pregnant with our fourth so that I could pursue this additional degree of higher learning. I would also like to express my appreciation to Mr. Jeffery Vanwey for agreeing to be the Chair for my MMAS committee and allowing me the freedom to explore my research. I would also like to thank Dr. O. Shawn Cupp and Mr. Don Myer for their steadfast guidance in directing me down the right path as I conducted this research. This project has helped me to grow not only as a student in an academic environment but also as a professional Army officer and sustainer to the force.

TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE	iii
ABSTRACT	iv
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS	vi
ACRONYMS	viii
ILLUSTRATIONS	ix
CHAPTER 1 INTRODUCTION	1
Overview	1
Problem Statement	2
Primary Research Question	2
Secondary Research Questions	2
Assumptions	3
Limitations	3
Delimitations	3
Conclusion	4
CHAPTER 2 LITERATURE REVIEW	5
Introduction	5
Problem Statement	5
Overview	5
AOE Logistics	6
Modular Logistics	11
Key Literature Findings	19
Conclusion	20
CHAPTER 3 RESEARCH METHODOLOGY	21
Introduction	21
Problem Statement	21
Methodology Type	21
Data Collection Methods	25
Data Analysis Methods	26
Conclusion	30

CHAPTER 4 ANALYSIS	31
Introduction.....	31
Problem Statement.....	31
Data Analysis.....	32
How has the Army’s New Modular Force Design Ensured Logistical Success for Future Combat Operations?	32
How was the Sustainment Structure Organized under AOE from the Corps Level and Below?	32
How is the Sustainment Structure Organized in the New Modular Concept from the Corps Level and Below?	33
The Tenets of ULO	34
Tenet 1. Flexibility.....	34
Tenet 2. Integration.....	35
Tenet 3. Lethality	36
Tenet 4. Adaptability	38
Tenet 5. Depth.....	39
Tenet 6. Synchronization	40
Key Data Analysis Findings	41
Synthesis of Key Analysis Findings with Key Literature Findings.....	42
Project Key Findings	43
Conclusion	44
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS.....	45
Introduction.....	45
Conclusions.....	45
Recommendations.....	46
Areas for Further Research	47
What the Researcher Learned	47
REFERENCE LIST	49

ACRONYMS

ADRP	Army Doctrine Reference Publication
AOE	Army of Excellence
BCT	Brigade Combat Team
BSB	Brigade Support Battalion
COL	Colonel
COSCOM	Corps Support Command
DISCOM	Division Support Command
FM	Field Manual
FSB	Forward Support Battalion
FSC	Forward Support Company
MSB	Main Support Battalion
ODS	Operation Desert Storm
TSC	Theater Sustainment Command
ULO	Unified Land Operations

ILLUSTRATIONS

	Page
Figure 1. Representative Army Support Structures in Fully Developed Theater	7
Figure 2. Map of Logistical Bases Established in Saudi Arabia, along the Main Supply Routes.....	10
Figure 3. Major Components of the Modular Force Sustainment Structure	13
Figure 4. Comparison of Support Personnel from the Pre-modular to the Modular Force Structure	16
Figure 5. Consistent Delivery of Combat Power Comparison between AOE Brigades and BCTs	17

CHAPTER 1

INTRODUCTION

The Army emerged from the Cold War as the world's premier ground force, capable of operating powerfully not only in Europe, but also in the Persian Gulf and Korea as well. Yet its force structure continued to reflect a traditional design. Its command structure continued to be highly vertical and layered, stretching from field armies and corps to divisions and brigades. The Army thought principally in terms of large-scale operations by corps and divisions: brigades of all types were mostly still embedded in divisions and not capable of independent operations on their own. Instead, division commanders were expected to draw upon their combat support/combat service support (CS/CSS) units to create brigade task forces that possessed the necessary support assets for each occasion. In addition, the Army continued to emphasize large CS/CSS structures provided by divisions, corps, and higher echelons. As a result, each division of 16,000 troops came attached with fully 32,000 support troops that were commanded by corps and field army headquarters. Taking its non-divisional support troops and war reserve stocks into account, an Army heavy division weighed over 300,000 tons, and a three-division corps, over a million tons. The effect was to make these formations highly powerful, but also big and unwieldy, incapable of deploying rapidly to distant areas that lacked prepositioned equipment and a well-developed infrastructure.

— R. L. Kugler, "Case Study in Army Transformation"

Overview

According to a case study by Richard Kugler on the Army Transformation, the major efforts to transform to a modular force did not officially start until 2001 after the Department of Defense published its new Quadrennial Defense Review (Kugler 2008, 9). Based on the new guidance from the Department of Defense, the Army restructured in order to enable combat support/combat service support structures to be tailored to the unique demands of each situation, rather than be deployed in fixed, prearranged packages that often would require larger than necessary support assets in order to ensure that all functions could be performed with the necessary strength (Kugler 2008, 20). This newly

issued guidance focused on a more hybrid threat and not so much on the near-peer threat we faced in the Persian Gulf.

Problem Statement

Post Operation Desert Storm (ODS), the Army remained well-prepared for contingencies requiring multiple divisions and corps, each of which could be sent with all of its organic combat and support assets (Kugler 2008, 8). If the Army were to mobilize against a near peer threat, it could be at a logistical disadvantage to provide initial sustainment to the theater of operation.

Primary Research Question

In order to conduct adequate research, the following question must be answered. How has the Army's new modular force design ensured logistical success for future combat operations? This question can be further explored by researching the following two secondary research questions.

Secondary Research Questions

In order to answer the primary research question it is important to focus on two secondary questions that directly relate to the research topic:

1. How was the sustainment structure organized under Army of Excellence (AOE) from the corps level and below?
2. How is the sustainment structure organized in the new modular concept from the corps level and below?

Answering the previous questions will afford the researcher the ability to explore this topic in depth.

Assumptions

The concept of transforming the Army into a new modular design had its origins in the early 1990s. By examining the different sustainment structures used over the last three decades it is important to note that different types of wars were and are still being fought (Kugler 2008, 9). From an initial near peer threat in ODS to a highly insurgency based War on Terror. One assumption we can make based on the success of these conflicts is that the sustainment force structure for each of these has been successful in providing what the Army needs, when the Army needs it. Another assumption is that the different types of wars require different types of sustainment structure.

Limitations

Based on the topic and nature of this research, the paper is limited to what the United States (U.S.) Army has used as its sustainment structure over the last 25 years and therefore cannot compare against what other nations Army's have done to support their war efforts. The reason for only using examples in the last 25 years is that is the period when the Army started to develop the idea to transform into a modular design (Kugler 2008, 9). Another limitation is the use of joint or sister service structures with regards to sustainment. This research focuses solely on Army sustainment force structure and how it has evolved to either improve or hinder future conflicts with near peer threats.

Delimitations

The research provided in this paper is limited to the last three decades from a time perspective. This research primarily focuses on the development of the new modular sustainment structure and how it compares to the structure used during our last

conventional conflict against the Iraqi Army in 1991. Limiting the timeline to this timeframe will allow the research to focus on more modern day applications of the subject.

Another delimitation is the narrow focus on the sustainment structure itself and avoidance of the specific systems used within the structure to conduct sustainment operations. Different sustainment systems improve with technological advances and attempting to compare systems would provide an unfair perspective when comparing the different structures. By eliminating the impact of specific systems, the research can focus mainly on the topic of force structure.

Conclusion

The modular concept for force structure has changed the way the Army conducts sustainment. In a modern era with hybrid threats, rapid mobilization of the Army is critical to accomplishing the mission. However, hybrid threats may not be the only threats we may face. If the U.S. faces another near peer threat, like we did in ODS, we will need to rapidly deploy large numbers of personnel and equipment. This research will answer the question of whether or not the new modular construct will be sufficient to mobilize the force.

CHAPTER 2

LITERATURE REVIEW

Introduction

The purpose of this research is to determine whether the sustainment force structure under the Army's new modular force design will ensure logistical success for future combat operations. The literature review will focus on existing documents that answer the primary and secondary research questions. The goal of the literature review will be to answer the questions and clearly associate topics within the literature as they relate to the problem statement. The documents used for the literature review will focus on the force sustainment structure of both the AOE as well as the force sustainment structure of today. A special emphasis will be placed on the use of the AOE structure during ODS since it was the largest deployment effort since Vietnam (King 2008, 2).

Problem Statement

Post ODS, the Army remained well-prepared for contingencies requiring multiple divisions and corps, each of which could be sent with all of its organic combat and support assets (Kugler 2008, 8). If the Army were to mobilize against a near peer threat, it could be at a logistical disadvantage to provide initial sustainment to the theater of operation.

Overview

The literature reviewed for this research project focuses on past literary documents that account for the task of moving supplies and equipment based on the force structure under the AOE. The researcher will also review works pertaining to sustainment

force structure used within the modular Army as a way to compare the methods of AOE to the present modular force structure. The Army's transformation to the new modular design it has seen a significant change in how the Army conducts sustainment.

AOE Logistics

The multi-echeloned system of sustainment used during the Cold War era led into the early 1990s as the U.S. was preparing to mobilize a significant size force into Southwest Asia. Moving two corps of personnel and equipment to the theater of operation would mean a significant stress on the sustainment structure. At the time there was a conceived lack of logistics infrastructure. According to an article from *Military Review* "shortly after the arrival at Dhahanu of the first elements of the 82nd Airborne Division, a decision was made that a support command was needed to control all logistic support in the theater of operations. This decision was based on the lack of Army logistics infrastructure" (Pagonis and Raugh Jr. 1991, 29). As a result, the 22nd Support Command (Theater Army Area) was established.

In 1995 the Army published a revised copy of Field Manual (FM) 100-10, *Combat Service Support*. In this manual, doctrinal concepts for sustainment from the theater level down to the battalion is adequately explained (see figure 1). The AOE design model for sustainment started with the multi-level logistics structure and began with the corps level with the Corps Support Command (COSCOM) and then went to the Division Support Command (DISCOM). The DISCOM in turn supported the Main Support Battalions (MSB) and finally the Forward Support Battalions (FSB). The task of moving and equipping 300,000 soldiers and over 126,400 pieces of equipment through the

different echelons of logistical support proved challenging but not impossible (Pagonis and Raugh Jr. 1991, 29).

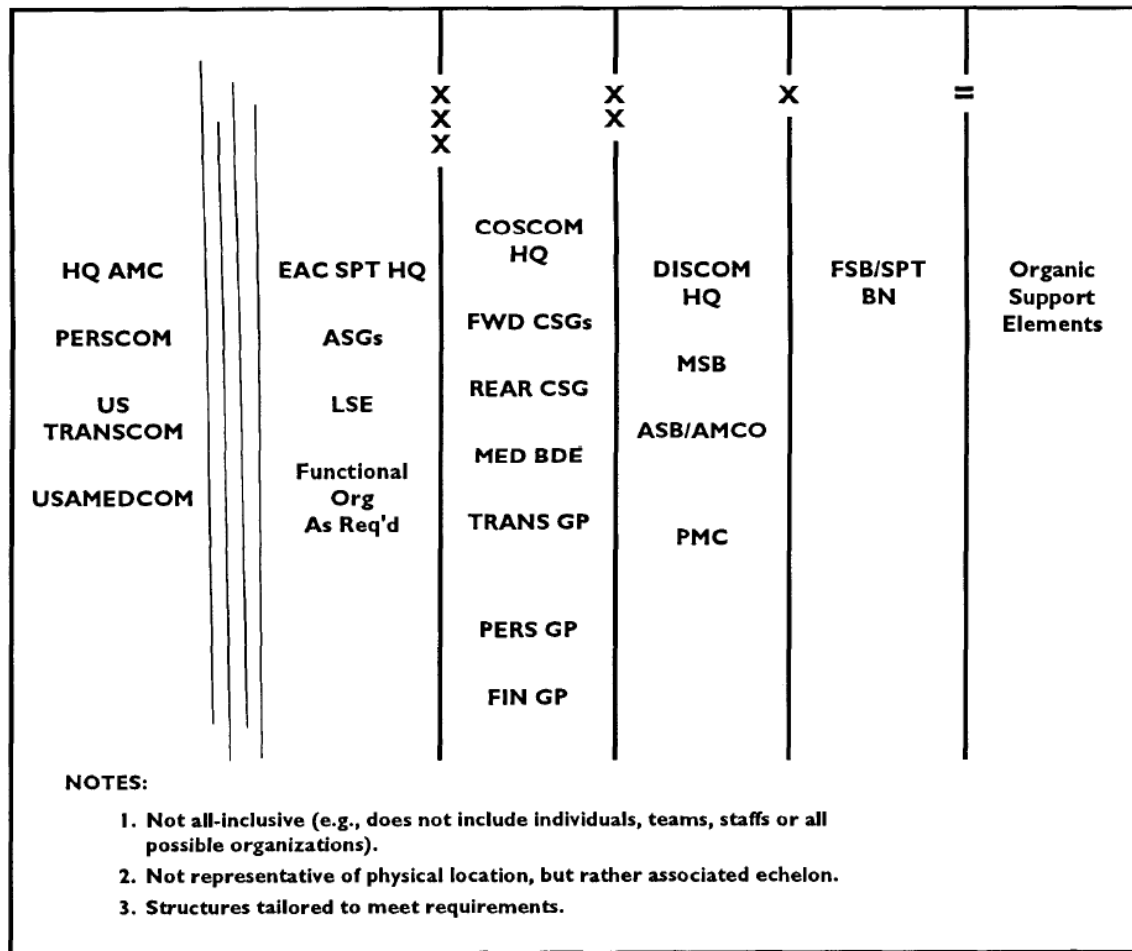


Figure 1. Representative Army Support Structures in Fully Developed Theater

Source: Headquarters, Department of the Army, Field Manual 100-10, *Combat Service Support* (Washington, DC: Government Printing Office, 1995), 3-2.

It is important to note that at each level there is a commander responsible for that organization. That commander is also responsible for that level of logistical support and

how it impacts the supported units. The corresponding supported units, like divisions and corps, could go to that commander for issues relating to their level of support.

In a 1992 report, a War College student, Lieutenant Colonel Daniel Fairchild, provided some lessons learned from the logistical operations of ODS. He suggests that “the supply company of the forward support battalion needs to be augmented with a transportation platoon. Such augmentation gives the support battalion the flexibility needed to support the brigade task force. This flexibility is needed when doctrinal ‘push’ system is disrupted and the ‘pull’ system has to be initiated” (Fairchild 1992, 31). This point makes it apparent that the sustainment structure that existed may not have had all the necessary transportation assets to provide seamless supply distribution.

One tactic used to ensure logistical success was the overwhelming amount of materiel and supplies sent in support of ODS. In an article in *Army Logistician* magazine Colonel (COL) Kenneth King describes the chaotic events leading into the struggles of commanding a company in a supply and service battalion. According to King, “at the strategic level, the interim fix was to push tons of no requisitioned supplies and equipment into theater” (King 2008, 38). He attributes the careless push of supplies to the lack of adequate systems needed to ensure units had what they needed when they needed it. King believes the lack of any theater distribution plan significantly contributed to the lack of logistical direction or guidance. As a result units had to sift through “Iron Mountains” of supplies in order to get what was required.

Although COL King mentions the initial lack of a theater distribution plan he does admit to one published shortly after the ground war started. As part of the newly formed theater distribution plan the Army would use logistics bases to facilitate the

movement of equipment and supplies from the rear areas all the way up front. “The Army supported military logistics bases that stretched 600 miles from the main supply bases at the Ad Damman and Al Jubail seaports in Kuwait” (King 2008, 39). The main purpose for the creation of the logistic bases was to pre-position supplies in an effort to set the conditions for a successful land engagement. Two specific logistic bases, Charlie and Echo, each supported a corps through use of the southern main supply routes (see figure 2). The use of these two logistics bases were an early indication the Army would transform from a supply based system to a distribution based system.

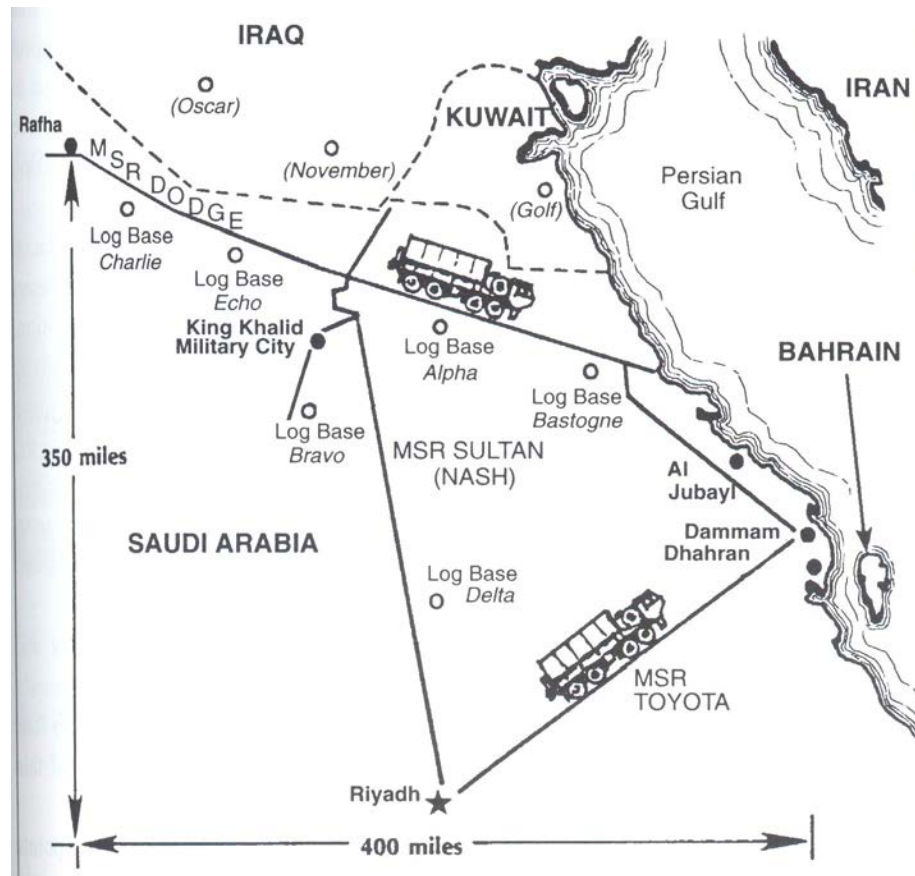


Figure 2. Map of Logistical Bases Established in Saudi Arabia, along the Main Supply Routes

Source: U.S. Army Transportation Museum, “Desert Wars,” U.S. Army Transportation Corps, <http://www.transportation.army.mil/museum/transportation%20museum/desertstorm.htm> (accessed 1 July 2013).

In a 2012 study conducted by the RAND institute for the Office of the Secretary of Defense, the authors provide justification for why the Army transitioned from the AOE to the modular force structure model. The article states that “to make BCTs more self-sufficient and better suited for their intended operations; the Army made some units organic to the BCT that formerly had been owned by the division” (Johnson et al. 2012, 21). As a result, the number of logistical personnel organic to the brigades increased. The

modular logistics portion of this chapter will address those significant changes made in the force structure.

As Operation Iraqi Freedom (OIF) began, the Army was still organized under the AOE model for sustainment force structure. In a report from a previous War College student, COL Joseph Lofgren, he states “the logistics challenges faced during OIF became evident when severe food and water shortages in forward combat units were reported by the media within ten days after decisive ground operations commenced. Armies have been outdistancing their supply lines since there have been armies. This is not new” (Lofgren 2007, 10). Here he acknowledges that despite efforts to change how we do logistics, some things may never change.

Lofgren goes on to say that “what is troubling is that this familiar problem befell a force that had been working for so many years at transforming its logistical structures, procedures, and policies to support the kind of rapid decisive operations that were planned and executed in Iraq. Transformation aimed to prevent such a shortfall in the continuity of support” (Lofgren 2007, 10). As the Army transitioned to the modular concept, it would use the lessons learned from previous experiences to make necessary adjustments.

Modular Logistics

The Army’s transition to a modular force has required changes across the force in an effort to streamline logistics. The deactivation of COSCOMs, DISCOMs, MSBs, and even FSBs has minimized the number of levels that equipment and supplies have to filter through before they reach the end user. According to Army FM 4-0, *Sustainment*, “modularity brought changes to how distribution and materiel management are

performed, especially at echelons above brigade” (Headquarters, Department of the Army 2009, x). The elimination of the previously mentioned echelons of sustainment has created a more throughput based system.

The Army published FM 3-92, *Corps Operations* in November 2010 and explained the concept for sustainment from the corps level down to the BSB (see figure 3). “Normally, modular sustainment forces are assigned or under operational control to the Theater Sustainment Command (TSC) for the theater army with support provided at every echelon of command: theater army, corps, division, and brigade” (Headquarters, Department of the Army 2010a, A-2). Theater level logistics starts at the TSC and filters down through the different unit levels. TSCs generally support the sustainment brigades located throughout the theater which deliver logistics to the divisions. Since the Army eliminated the AOE model, sustainment brigades will use combat sustainment support battalions to deliver supplies, equipment, and materiel to the brigade combat teams (BCT) through their brigade support battalion (BSB). The final link in the process of providing logistics is the link between the BSB and the forward support companies (FSC). Although organic to the BSB, FSCs support the maneuver battalions as a way of providing support as far forward as possible on the battlefield.

In a report from a previous War College student, COL Joseph Lofgren, he mentions the significant shift in sustainment force structure as part of the modular transformation. “From 2000 to 2002, CASCOC shifted its focus to the development of combat service support strategies and concepts for the Stryker Brigade. Transformation focused on the redesign of the existing Forward Support Battalions to Brigade Support Battalions, to include companies organized along the lines of the Force XXI model

Forward Support Company” (Lofgren 2007, 6). “FSCs provide field feeding, fuel, ammunition, field maintenance, and distribution support for a combat arms battalion. While normally under the command of the BSB, an FSC may be placed in either a command or support relationship with its supported battalion. Command relationships, such as operational control or TACON [tactical control], are generally limited in duration and focused on the completion of a particular task or mission” (Headquarters, Department of the Army 2010b, 6-1). This concept allows for the best practice of supporting as far forward as possible.

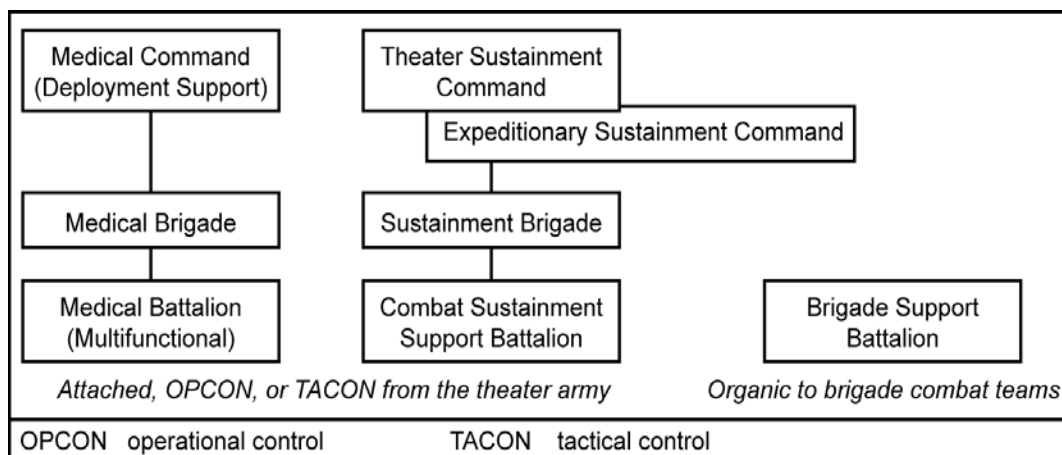


Figure 3. Major Components of the Modular Force Sustainment Structure

Source: Headquarters, Department of the Army, Field Manual 3-92, *Corps Operations* (Washington, DC: Government Printing Office, 2010), A-2.

In an article from *Army Logistician*, COL Guy C. Beougher, discusses the adaptations Army units must endure as part of the new modular concept. COL Beougher was the commander of the 1st Armored Division’s DISCOM, and saw firsthand how the modular design changed the sustainment structure. According to him “the intent of the

logistics modular force design is to have a single person in charge of logistics, end to end, in a theater of operations, and that person will be the commander of the theater sustainment command (TSC)” (Beougher 2006, 10). He goes on to explain that end to end however stops at the sustainment brigade and does not apply to logistics conducted down at the BSB level.

COL Beougher points out that since the DISCOM has disappeared, many of the sustainment functions it once supported fall on the BCT commanders as an added responsibility. He challenges whether it is critical to make the “warfighter” a logistician now that much of the sustainment responsibility falls into their arena. He states “In garrison, the BCT commander owns his organizational and direct support (DS) logistics. He rates his logisticians and has fiscal responsibility for the BCTs execution of logistics. He provides guidance to his DS maintenance activities and supply support activities (SSA). He makes sure that the current maintenance and supply regulations are followed while also overseeing the transformation of his maintenance systems to two-level maintenance” (Beougher 2006, 10). COL Beougher questions whether these responsibilities are too much for a BCT commander whose primary mission is the fight.

To counter COL Beougher’s argument about too much weight placed on the BCT commanders shoulders, it is important to note that the modular BCTs are designed to operate independently. Therefore reliance on various supporting units would mean adding to a footprint that may already be too big for the operating environment. The modular design allows the maneuver brigades to operate in locations well-removed from their parent divisions and corps (Kugler 2008, 11).

Under the AOE design division logistics monthly reviews analyzed the division's readiness with regards to capabilities and requirements in order to logistically support the division. This type of review would generally compare DS level logistical statistics and determine the status of those units within the division. Typically the review was between the assistant division commander of support and the DISCOM commander. COL Beougher addresses these reviews in his article and points out that such reviews may not be as effective under the new modular design.

One example for a review component is the trend analysis which can compare one direct support level unit against another. By doing this the division can cross level ideas and concepts that work for some and maybe not work for others. He states that such analysis allows "units to see themselves more clearly and make needed improvements" (Beougher 2006, 11). Since the DISCOM no longer exists, such reviews will fall on the shoulders of the division G4 (division level lead sustainment staff officer).

The minimizing of echelons of sustainment also means not as much oversight for tasks that require a significant amount of discipline. For example, the turn in process for combat spares that are either serviceable or recoverable. Although this system underwent a recent overhaul to avoid needless waste, it still remains a large budgetary issue with most BCTs. A slow supply system would sometimes cause units to build up a stock pile of serviceable parts, fearing they may not get them when they need them. In Iraq in 2006, this was common place since most units operated out of the same forward operating base their entire deployment. Without the proper oversight this issue has the capability to cost a BCT millions of dollars. This type of oversight is not so apparent under the new

modular design. The researcher experienced this first hand when positioned at Forward Operating Base Wilson, just outside of the Iraqi village of Adwar.

In the Army’s transition to the modular design, it added personnel numbers to brigades in areas usually supported by division. “These units, most notably a cavalry squadron, artillery battalion, brigade special troop’s battalion, and a brigade support battalion” (Johnson et al. 2012, 21). An illustration in the personnel comparison and combat logistics ratio is in figure 4.

Comparison of Support Personnel

Structure	Heavy Brigade			Infantry Brigade		
	Premodular (tank)	Premodular (mechanized)	Modular	Premodular (light infantry)	Premodular (airborne)	Modular
Total personnel	3,624	3,692	3,645	2,812	3,249	3,447
Logistics personnel ^a	652	451	731	377	450	634
% logistics personnel	18	12	20	13	14	18
Combat-to-logistics ratio	2.4/1	4.0/1	1.9/1	4.7/1	4.5/1	2.7/1
Tooth to tail (total-to-logistics ratio)	5.6/1	8.2/1	5.0/1	7.5/1	7.2/1	5.4/1
CS personnel ^b	656	593	492	348	409	413
% CS	18	16	13	12	13	12

^a Includes transportation corps, ordnance, quartermaster, and multifunctional personnel assigned to the brigades.

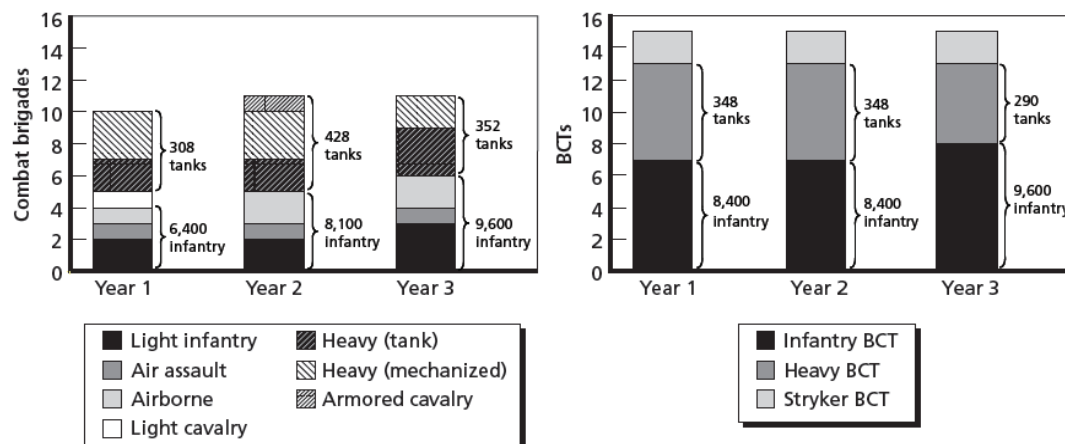
^b Includes engineers, signal, MP, military intelligence, PSYOPS, civil affairs, public affairs, and chemical.

Figure 4. Comparison of Support Personnel from the Pre-modular to the Modular Force Structure

Source: Stuart E. Johnson, John E. Peters, Karin E. Kitchens, Aaron L. Martin, and Jordan R. Fischbach, *A Review of the Army's Modular Force Structure* (Santa Monica, CA: The RAND, 2012), 22.

The Army needed to accomplish three major objectives in order to meet the demands of the National Defense Strategy. First it had to modularize the force and meet the demands of a changing mission. Second, it had to grow the Army initiative in order to meet the increased threats. Third, it had to rebalance the Army in order to ensure it had the right number of personnel and equipment in the right units. “A key benefit arising from these processes is an Army that can provide a steady and predictable supply of forces to the campaign. In this context, steady and predictable has two meanings: it reflects the current force structure’s ability to generate combat power and the Army’s ability to provide balanced force packages” (Johnson et al. 2012, 24). Figure 5 illustrates the difference in ability to deliver combat power as studied by the RAND institute.

Consistent Delivery of Combat Power



SOURCE: MTO&E data.

NOTE: Figure assumes 1:2 BOG-to-dwell ratio. BOG = boots on the ground.

Figure 5. Consistent Delivery of Combat Power Comparison between AOE Brigades and BCTs

Source: Stuart E. Johnson, John E. Peters, Karin E. Kitchens, Aaron L. Martin, and Jordan R. Fischbach, *A Review of the Army's Modular Force Structure* (Santa Monica, CA: The RAND, 2012), 25.

It is important to note that in figure 5, the column to the left illustrates the AOE structure as if it were resourcing a three-year cycle of the Army Force Generation process. A couple of “things are notable about this part of the figure. First, each annual stack of Army units is composed of many more types, and some are unique. Thus, if the 2nd Armored Cavalry regiment were due relief, there was no other armored cavalry regiment in the force structure exactly like it; the gaining combatant command would have to adjust the mission and area of operations for the new unit in a way that was commensurate with its capabilities” (Johnson et al. 2012, 26). The second notable feature is the varying amount of infantry and armor units. This inconsistency would likewise have different effects in the overall plan.

The study conducted by the RAND cooperation concluded that the modular force design was better for supporting current and future operations (Johnson et al. 2012, 26). One of the reasons is “because the Army made key CS and CSS units organic to the BCTs, they are more self-sufficient than the pre-modular force. This means that when they deploy, they arrive with the component elements they need to prepare to move into action” (Johnson et al. 2012, 26). This newly designed self-sufficient BCT provides the flexibility and adaptability required to mobilize against any threat.

Coincidentally, the Army’s transformation to the new modular concept was implemented about the same time as the new two-level maintenance concept evolved and was implemented. The reason for this new two-level system was to conform to the smaller footprint design implemented throughout the rest of the Army (Stevenson 2002, 6). Prior to the two-level maintenance design the Army used a four-level design:

1. Unit/Organizational level: all maintenance is repair and return to user
2. Direct Support (DS): maintenance is mostly repair and return to user, some is repair and return to supply system.
3. General Support (GS): maintenance is mostly repair and return to supply system, some is repair and return to user.
4. Depot: maintenance is repair and return to supply (Stevenson 2002, 6).

Timing wise it worked out well, as FSBs were phased out so was the four-level maintenance system the Army used under the AOE model. The design of the two-level maintenance concept minimized a logistical footprint for future operations. At the time, General Mitchell H. Stevenson was the Chief of Ordnance, when he first wrote about the transformation in an issue of the *Army Logistician* magazine. He explains his vision “of a two-level maintenance system that essentially will combine the unit with the DS levels of maintenance (and be called field maintenance) and combine the GS with the depot levels (and be called sustainment maintenance)” (Stevenson 2002, 6). The newer two-level concept was to provide a higher level of maintenance support as far forward on the battlefield as possible.

Key Literature Findings

A review of these documents has made it clear that certain findings will directly impact this research prior to the final analysis. The sustainment structure under the AOE model had more echelons of support for which to support combat units. Each of these commands had a single commander in charge to direct logistical planning and execution. This multiple echelon system inherently meant more coordination and the requirement

for systems needed to conduct logistical operations. As was pointed out during ODS, these systems were hard to put in place.

The newer modular Army design forced the sustainment structure to cut echelons of command out of the model and put more responsibility on division and brigade commanders to provide oversight for logistical planning and execution. The modular design eliminated the multiple echelons and created a system that allowed for more throughputs based logistical support. It also made the new two-level maintenance design easier to adopt since fewer levels of support were used in any theater of operations.

Conclusion

The documents reviewed for this research project provide current knowledge about the subject. In order to ensure adequate answers to all the research questions there must be a method designed to correlate the literature findings. The methodology in chapter 3 outlines and describes the method used to arrange the information.

CHAPTER 3

RESEARCH METHODOLOGY

Introduction

The purpose of this research is to determine whether the sustainment force structure under the Army's new modular design is better for rapidly deploying combat power. This chapter will focus on the methodology used in order to conduct such research. Throughout this chapter the methodology type, data collection methods and data analysis methods are explained in order to establish a solid and authoritative methodological model.

Problem Statement

Post ODS, the Army remained well-prepared for contingencies requiring multiple divisions and corps, each of which could be sent with all of its organic combat and support assets (Kugler 2008, 8). If the Army were to mobilize against a near peer threat, it could be at a logistical disadvantage to provide initial sustainment to the theater of operation.

Methodology Type

The methodology used to research this topic will be a qualitative method mostly derived from John Creswell's book *Qualitative Inquiry and Research Design*. Qualitative research will allow the researcher to investigate how the Army's sustainment force structure operated in both the AOE as well as the modular model without having to utilize specific statistics or other quantifiable data that can be skewed based on its source. According to Sharan B. Merriam an "important characteristic of qualitative research is

that the process is inductive; that is, researchers gather data to build concepts, hypotheses, or theories rather than deductively testing hypotheses as in positivist research. Qualitative researchers build toward theory from observations and intuitive understandings gleaned from being in the field” (Merriam 2009, 15).

The researcher will use a combination of sources to create a triangulated research methodology to ensure accurate research in an orderly fashion. It is important to the researcher that the methodology used is consistent with the overall goal of the project. The foundation of this project is to investigate the difference in sustainment force structure and how it best suits the needs of the Army. This may be interpreted to mean a possible change in structure should one example provide better capability than the other. According to Merriam “critical qualitative research focuses on societal critique in order to raise consciousness and empower people to bring about change” (Merriam 2009, 23). If change is necessary to better support sustainment operations it will be addressed in the conclusions and recommendations portion of this research.

The first source from which the researcher will extract a model for methodology is John W. Creswell’s *Qualitative Inquiry and Research Design*. The basis of the methodological model will follow John W. Creswell’s narrative design for qualitative research among others. Although Creswell says there is no “lock-step approach,” he does list five steps in the process of conducting a narrative study (Creswell 2007, 55).

The first step is to determine if the narrative approach fits the research. The second step is to gather the different sources from which to conduct the research. The third step is to draw from those sources the pertinent information required to conduct the research. The fourth step is to analyze the information or data collected and decide the

best method to organize it. In his fifth step, Creswell says to “collaborate with participants by actively involving them in the research” (Creswell 2007, 57). This fifth step can morph into a synthesis step in order to develop a solid analysis of the data collected and application to the research.

In order to create the multi-method approach the research methodology will also include some basic concepts from authors Martin Davies and Sharan Merriam. By following Davies concept of “simply pursue(ing) each task step by step in an organized fashion” the research can develop a super model from which to draw an analysis (Davies 2007, 205). Just as Creswell indicates, there is lack of a step-by-step process for this methodology. This is evident in both Davies and Merriam’s books about qualitative research. Therefore the researcher must take concepts or principles from their discussion on general qualitative research in order to build the authoritative model necessary to conduct this project.

In Merriam’s book it is evident that one primary principle in conducting qualitative research is to collect the data. Although she mentions different types of collection methods she points out that document analysis is one such method. Document analysis will be the primary means for collecting data for the purpose of this research project. Another principle she makes clear is the analysis of collected data. According to Merriam “the analysis of the data involves identifying recurring patterns that characterize the data. Findings are these recurring patterns or themes supported by the data from which they were derived” (Merriam 2009, 23). The third principle of qualitative research Merriam discusses is the necessity to interpret the understanding of the phenomenon of

interest. In this case the phenomenon being the essence of Army sustainment and how it works.

In Davies book, *Doing a Successful Research Project*, he describes a narrative analysis as a “content analysis.” He states that you (the researcher) can “conduct content analyses of anything that is written down or otherwise recorded” (Davies 2007, 181). He goes on to list four main procedures necessary for conducting qualitative research. The first is to identify the research problem and develop the appropriate questions in order to conduct the proper investigation. The second step is to determine the sampling method. In the case of a narrative analysis this means determining what sources to use in order to achieve non-biased results. The goal of this step is to “be able to claim that the data you emerge with is representative of the source and its content” (Davies 2007, 182). Only the first two steps of Davies model are used in conjunction with the other two authors to develop the authoritative model used for this research.

The application of the above mentioned models and concepts for conducting qualitative research can be formed into one model. According to Merriam, “qualitative researchers can never capture an objective ‘truth’ or ‘reality,’ there are a number of strategies that you as a qualitative researcher can use to increase the credibility of your findings. Probably the most well-known strategy to shore up the internal validity of a study is what is known as triangulation” (Merriam 2009, 215). A combination of the three authors will form the triangulated model necessary to claim the model as authoritative. The following step-by-step model is used for this particular research project:

1. Establish the Narrative model as the primary qualitative methodology. This model allows the analysis of documents as the main source for gathering

information. This is critical since there will not be any personal interviews conducted.

2. The second step is to gather the necessary materials and information needed to conduct the research. The primary means used for this is addressed in the data collection methods also in this chapter.
3. The third step will be to analyze the data. In this step the researcher will review the literature and extract common themes and recurring ideas, and develop key findings based on those. This step will also include a compare and contrast section showing the advantages and disadvantages of different designs the Army has used. The comparison is based on the six tenets of Unified Land Operations (ULO) as outlined in Army Doctrine Reference Publication (ADRP) 3-0, *Unified Land Operations*.
4. The fourth step will be to synthesize the key literature findings with the key data findings. This step is critical in constructing a common picture should the literature review lack sufficient evidence to support the research and the key data findings are necessary to support it.

Data Collection Methods

Based on John Creswell's methodology data is collected through a combination of methods in order to utilize various means of electronic and printed media. The majority of data collected will be through internet research and library materials. This method may also include using Microsoft Excel documents in order to track and analyze data that involves raw numbers or exact dates and actions.

In Creswell's text he addresses data collection methods and provides a table for referencing common activities based on his five approaches to qualitative research methods. While collecting data the research will address what is traditionally studied or was studied in order to compare work already done as it relates to the topic. It will also be critical to ensure access to the above mentioned materials is readily available since time is a constraint during the course of this research. A third and very important issue is the identification of struggles usually associated with data collection. Identifying these issues early can help alleviate potential problems.

Data Analysis Methods

Analyzing the data is an extremely critical element to conducting research because it extrapolates information from the raw data as it directly applies to the research conducted. Creswell developed six different stages to his concept of data analysis and representation. Listed below are the six different steps Creswell uses to analyze data and shows how they correspond with the narrative methodology:

1. Data Managing: Creating and organizing files for the data
2. Reading: Read through text and make notes
3. Describing: Describe the objective and place it in chronological order if necessary
4. Classifying: Identify contextual materials
5. Interpreting: Interpret the broader meaning of the data
6. Represent or visualize: Present narration focusing on processes (Creswell 2007, 156-157).

Often data analysis is conducted in conjunction with data collection since organizing collected data is a step within the analysis. Merriam addresses the necessity of early analysis in her book. She states that “the organization and management of your data also begins early but must be completed once all the data have been collected to enable intensive analysis” (Merriam 2009, 169). Merriam’s concept of starting early directly corresponds with Creswell’s first step of data managing. By sorting the data into categories early in the phases of research it will be easier to break down the data into different categories.

Breaking down into categories is done in various ways and for different reasons. Merriam says “the overall process of data analysis begins by identifying segments in your data set that are responsive to your research questions” (Merriam 2009, 176). Two categories that will be necessary to review will be the AOE model and the Army modularity concept. By breaking the research down into these two models it will be easier to illustrate the differences between the two and draw both the positive and negative aspects of each as they apply to Army force sustainment structure. These two categories are compared in terms of how effective they are when addressing the tenets of ULO.

According to ADRP 3-0, “the tenets of ULO describe the Army’s approach to generating and applying combat power in campaigns and major operations” (Headquarters, Department of the Army 2011b, 2-12). Since the research problem statement focuses on engaging in a future military operation, it is critical that the research use current planning doctrine when comparing the two structures. The doctrine of ULO has become the Army’s new planning tool when analyzing future operations. ADRP 3-0

has broken down the six tenets of ULO in just enough detail to explain how each one effects the generation and application of combat power.

The six tenets are: flexibility, integration, lethality, adaptability, depth, and synchronization. Each of these plays a large role in overall mission success and each can be used as a metric for how the two sustainment structures would be effective in future operations. “To achieve tactical, operational, and strategic success, commanders seek to demonstrate flexibility in spite of adversity. They employ a versatile mix of capabilities, formations, and equipment for conducting operations” (Headquarters, Department of the Army 2011b, 2-12). It will be critical to this research to be able to show how each force structure can or cannot allow for flexibility when conducting combat operations.

The next tenant, integration, is critical to being able to work with other units as part of a greater effort. “Army forces do not operate independently but as a part of a larger unified action. Army leaders integrate Army operations within this larger effort” (Headquarters, Department of the Army 2011b, 2-13). When used in the analysis this tenant will show the compatibility of sustainment structures and how that relates to supporting the operation.

Lethality, although not directly associated with sustainment units, can only be possible when the correct support is in place. “Effective decisive action relies on lethality. The capacity for physical destruction is a foundation of all other military capabilities, the most basic building block for military operations” (Headquarters, Department of the Army 2011b, 2-13). The generation of combat power directly relates to a unit’s ability to be lethal. Both sustainment models have the ability to generate combat power, but the research will focus on which is more effective.

The ability to adapt to situations is essential to mission success, especially in combat operations. “Adaptability reflects a quality that Army leaders and forces exhibit through critical thinking, their comfort with ambiguity and uncertainty, their willingness to accept prudent risk, and their ability to rapidly adjust while continuously assessing the situation” (Headquarters, Department of the Army 2011b, 2-13). Just as maneuver units must be adaptable, so too must logistical units. It is critical to be able to keep the supply chain moving when the plan takes an unexpected turn.

Since a battlefield can be deep, it is important that forces be able to strike both near and far targets. “Depth is an extension of operations in time, space, or purpose, including deep-close-security operations, to achieve definite results. Army leaders strike enemy forces throughout their depth, preventing the effective employment of reserves, command and control nodes, logistics, and other capabilities not indirect contact with friendly forces” (Headquarters, Department of the Army 2011b, 2-14). The proper placement of key logistical support nodes will enable a leader the ability to attack in depth. This research will be able to determine which sustainment structure is more effective when placing such nodes.

The tenant of synchronization means getting the right supplies to the right place at the right time. According to ADRP 3-0 “synchronization is the arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time. It is the ability to execute multiple related mutually supporting tasks in different locations at the same time, producing greater effects than executing each in isolation” (Headquarters, Department of the Army 2011b, 2-14). The ability to synchronize logistical support with maneuver forces must be part of every plan for

combat operations. This research will explore which structure permits the best synchronization as it would relate to our next near peer threat.

Conclusion

The use of a qualitative narrative methodology will allow the researcher to examine multiple documents as they apply to the research topic. Drawing facts and fact based assumptions from such documents will allow the researcher to synthesize findings and thus make solid conclusions and recommendations. This synthesis will be done as part of the analysis which will be completed in chapter 4 with the comparison of the two models of sustainment structures as they relate to the six tenets of ULO.

CHAPTER 4

ANALYSIS

Introduction

The purpose of this research is to determine whether the sustainment force structure under the Army's new modular design is better for rapidly deploying combat power. This chapter will provide an in-depth analysis regarding the research conducted in order to draw a solid conclusion and make recommendations directly related to the problem statement. The format for this chapter will follow the primary and secondary research questions and provide the literature findings and data findings related to each question. It will then compare the two different models as they apply to the six tenets of the ULO.

It is important to make sure the research follows the established methodology to maintain credibility. Therefore, this chapter will provide data analysis as discussed in the model method from chapter 3. The end of this chapter will have key data findings different from any key literature findings already discussed in the literature review. The key data findings is followed by a synthesis of key literature findings and key data findings in order to establish overall key research project findings and apply those to the project conclusions and recommendations.

Problem Statement

Post ODS, the Army remained well-prepared for contingencies requiring multiple divisions and corps, each of which could be sent with all of its organic combat and support assets (Kugler 2008, 8). If the Army were to mobilize against a near peer threat,

it could be at a logistical disadvantage to provide initial sustainment to the theater of operation.

Data Analysis

How has the Army's New Modular Force Design Ensured Logistical Success for Future Combat Operations?

The Army's new modular force design has created units with more self-sustaining capabilities already organized into rapidly deployable forces. The organic capability of a BCT to logistically sustain itself means more flexibility on a strategic, operational, and tactical level. Combat operations against a near peer threat pose more conventional dangers at all levels of war.

Strategically, a BCT is a rapidly deployable combat unit capable of being deployed across the globe already having its own logistical capability and not having to attach outside elements to provide initial logistical support. Operationally, a BCT can establish an initial footprint and begin the first phases of an operation before relying on higher echelon sustainment support. A BCT carries three combat loads of supplies for initial combat operations. Tactically, it is better to have an assortment of forces with a capability to vary its lethality in order to conduct combat operations. The flexibility of lethality and integrated sustainment support make a BCT more strategically mobile.

How was the Sustainment Structure Organized under AOE from the Corps Level and Below?

The AOE design model for sustainment started with the multi-level logistics structure and began with the corps level with the COSCOM and then went to the DISCOM. The DISCOM in turn supported the MSB and finally the FSB.

The sustainment structure under the AOE model had more echelons of support for which to support combat units. Each of these commands had a single commander in charge to direct logistical planning and execution. This multiple echelon system inherently meant more coordination and the requirement for systems needed to conduct logistical operations. The concept of centralized control and de-centralized operations required a more complex system for maintaining support. As was pointed out during ODS, these systems were hard to put in place.

How is the Sustainment Structure Organized in the New Modular Concept from the Corps Level and Below?

In order to replace the multiple echelons without losing the ability to provide the necessary support, the Army introduced different units theoretically capable of accomplishing the same mission. Theater level logistics starts at the TSC and filters down through the different unit levels. TSCs generally support the sustainment brigades located throughout the theater which deliver logistics to the divisions. Since the Army eliminated the DISCOM model, sustainment brigades will use combat sustainment support battalions to deliver supplies, equipment, and materiel to the BCTs through their BSB. The last link in the system of providing logistics is the relationship between the BSB and the FSC. Although organic to the BSB, FSCs are attached to maneuver battalions as a way of supporting as far forward as possible on the battlefield.

The newer modular Army design forced the sustainment structure to cut echelons of command out of the model and put more responsibility on division and brigade commanders to provide oversight for logistical planning and execution. The modular design eliminated the multiple echelons and created a system that allowed for more

throughputs based logistical support. It also made the new two-level maintenance design easier to adopt since fewer levels of support were used in any theater of operations.

As mentioned in chapter 3, it is necessary to develop two categories to compare and contrast the two different models examined as part of this research. The two models are examined by their ability of effectiveness when using the six tenets of ULO. This technique will validate that the research can support ideas based on current and future operations.

The Tenets of ULO

Tenet 1. Flexibility

The tenant of flexibility allows commanders to quickly alter plans should they need to. “To achieve tactical, operational, and strategic success, commanders seek to demonstrate flexibility in spite of adversity. They employ a versatile mix of capabilities, formations, and equipment for conducting operations” (Headquarters, Department of the Army 2011b, 2-12). Flexibility exists in both the AOE and modular sustainment structures. However, the organic support relationship between the BSB and the BCT allows the modular model to be more flexible.

Flexibility with regards to logistical support does not always mean just using what you have. During ODS the commander had to be flexible enough in his plan to allow for a new command to stand up. According to an article from *Military Review* “shortly after the arrival at Dharan of the first elements of the 82nd Airborne Division, a decision was made that a support command was needed to control all logistic support in the theater of operations. This decision was based on the lack of Army logistics infrastructure” (Pagonis and Raugh Jr. 1991, 29). As a result the 22nd Support Command (Theater Army

Area) was established. The requirement for a Support Command was identified despite the current operational plan and the flexibility of the planning staff meant that such a command could be established.

Flexibility allows units to move with minimal friction, and the new modular concept does just that. Under the modular concept BSBs and FSCs are providing the forward portion of logistical support to maneuver units. Although organic to the BSB, FSCs are attached to maneuver battalions as a way of supporting as far forward as possible on the battlefield. The modular model allows maneuver unit commanders the flexibility to move units and still maintain logistical continuity without having to coordinate with an outside or supporting unit.

Lieutenant Colonel Daniel Fairchild's report, "Operational Aspects of a Forward Support Battalion Participating in Operations Desert Shield and Dessert Storm," points out some great lessons learned. For example, the AOE sustainment structure may have lacked flexibility in some areas. His report states "the supply company of the forward support battalion needs to be augmented with a transportations platoon. Such augmentation gives the support battalion flexibility needed to support the brigade task force" (Fairchild 1992, 31). This point makes it apparent that the sustainment structure that existed as part of the AOE may not have had all the necessary transportation assets to provide seamless supply distribution.

Tenet 2. Integration

The next tenant, integration, is critical to being able to work with other units as part of a greater effort. "Army forces do not operate independently but as a part of a larger unified action. Army leaders integrate Army operations within this larger effort"

(Headquarters, Department of the Army 2011b, 2-13). Integration is touted as the key principle of sustainment. “Integration is joining all the elements of sustainment to operations assuring unity of purpose and effort” (Headquarters, Department of the Army 2009, 1-2). Each model displays some form of integration however; the organic nature of the BSBs belonging to the BCT requires integration to a greater extent.

The AOE design model for sustainment started with the multi-level logistics structure and began at the corps level with the COSCOM and then went to the DISCOM. The DISCOM in turn supported the MSB and finally the FSB. The integration that existed was of a supporting nature and had not as much depth as a unit assigned or attached operational control.

The deactivation of COSCOMs, DISCOMs, MSBs, and even FSBs has minimized the number of levels that equipment and supplies have to filter through before they reach the end user. According to the Army FM 4-0, *Sustainment*, “modularity brought changes to how distribution and materiel management are performed, especially at echelons above brigade” (Headquarters, Department of the Army 2009, x). The elimination of the previously mentioned echelons of logistics has created a relationship between the BCT and the BSB that was not a part of the AOE model. Since the BSB is an organic supporting unit, the BCT commander has more leverage in how the BCT is supported. Therefore, there appears to be a higher level of integration in the new modular model for sustainment structure.

Tenet 3. Lethality

Lethality, although not directly associated with sustainment units, can only be possible when the correct support is in place. “Effective decisive action relies on

lethality. The capacity for physical destruction is a foundation of all other military capabilities, the most basic building block for military operations” (Headquarters, Department of the Army 2011b, 2-13). The generation of combat power directly relates to a unit’s ability to be lethal. Each sustainment structure has the ability to generate combat power.

Under the AOE model, generating combat power in order to achieve lethality was best observed during ODS when the Army needed to mobilize its force. One tactic used to ensure logistical success was the overwhelming amount of materiel and supplies sent in support of ODS. In an article in *Army Logistician* magazine COL Kenneth King describes the chaotic events leading into the struggles of commanding a company in a supply and service battalion. According to King, “at the strategic level, the interim fix was to push tons of non-requisitioned supplies and equipment into theater” (King 2008, 38). He attributes the careless push of supplies to the lack of adequate systems needed to ensure units had what they needed when they needed it. King believes the lack of any theater distribution plan significantly contributed to the lack of logistical direction or guidance. As a result units had to sift through “Iron Mountains” of supplies in order to get what each unit required. Although this method proved chaotic, it brought what was needed to the fight.

The modular sustainment model allows for a more rapid response when generating combat power. One of the ways it goes about doing this is through the maintaining of equipment. Coincidentally, the Army’s transformation to the new modular concept was implemented about the same time as the new two-level maintenance concept evolved and was implemented. The reason for this new two-level system was to conform

to the smaller footprint design implemented throughout the rest of the Army (Stevenson 2002, 6). The new manning authorizations allowed for more low skills military occupational specialties to work in FSCs which meant a quicker turnaround time on critical equipment like small arms, radios, and night vision goggles. Generating and maintaining combat power under the new modular model appears quicker and less demanding on current systems.

Tenet 4. Adaptability

Adaptability is much like the sustainment principle of improvisation. According to FM 4-0 “improvisation is the ability to adapt sustainment operations to unexpected situations or circumstances affecting a mission” (Headquarters, Department of the Army 2009, 1-3). Sustainment or logistics units must be able to improvise when the operation takes an unexpected turn and maneuver units must adapt to the new situation.

Maneuver units understand the importance of adaptability just as much as sustainers understand the ability to improvise. “Adaptability reflects a quality that Army leaders and forces exhibit through critical thinking, their comfort with ambiguity and uncertainty, their willingness to accept prudent risk, and their ability to rapidly adjust while continuously assessing the situation” (Headquarters, Department of the Army 2011b, 2-13). Just as maneuver units must be able to adapt, so too must logistical units. It is critical to be able to keep the supply chain moving when the plan takes an unexpected turn. In terms of adaptability, neither model holds an advantage over the other.

When U.S. forces arrived in Saudi Arabia they knew a plan must be revised with regards to theater distribution. As part of the newly formed theater distribution plan during ODS the Army would use logistics bases to facilitate the movement of equipment

and supplies from the rear areas all the way up front. “The Army supported military logistics bases that stretched 600 miles from the main supply bases at the Ad Damman and Al Jubail seaports in Kuwait” (King 2008, 39). The main purpose for the creation of the logistic bases was to pre-position supplies in an effort to set the conditions for a successful land engagement. Two specific logistic bases, Charlie and Echo, each supported a corps through use of the southern main supply routes (see figure 2). This example illustrates how the AOE model allows for maximum adaptability.

In order to ensure the ability to rapidly adapt to situations the Army eliminated certain echelons of support and replaced them with others. The deactivation of COSCOMs, DISCOMs, MSBs, and even FSBs has minimized the number of levels that equipment and supplies have to filter through before they reach the end user. According to the Army FM 4-0, *Sustainment*, “modularity brought changes to how distribution and materiel management are performed, especially at echelons above brigade” (Headquarters, Department of the Army 2009, x). Maneuver units are now within a short reach of some critical logistical capabilities. Without having to rely on longer ground lines of communication, they can easily adapt to the situation and receive supplies and equipment quicker.

Tenet 5. Depth

Both models allow for maneuver units to be able to fight the deep fight. “Depth is an extension of operations in time, space, or purpose, including deep-close-security operations, to achieve definite results. Army leaders strike enemy forces throughout their depth, preventing the effective employment of reserves, command and control nodes, logistics, and other capabilities not indirect contact with friendly forces” (Headquarters,

Department of the Army 2011b, 2-14). The proper placement of key logistical support nodes will enable a leader the ability to attack in depth. Based on the following analysis neither model seems to offer an advantage over the other.

As tested during ODS, the sustainment structure that existed under AOE was more than capable of providing adequate support to the maneuver units. In an effort to support the deep fight as coalition forces moved across Saudi Arabia and into Iraq the development of logistical bases became critical. As previously mentioned in chapter 2 “the Army supported military logistics bases that stretched 600 miles from the main supply bases at the Ad Damman and Al Jubail seaports in Kuwait” (King 2008, 39). The main purpose for the creation of the logistic bases was to pre-position supplies in an effort to set the conditions for a successful land engagement. Two specific logistic bases, Charlie and Echo, each supported a corps through use of the southern main supply route. Under the modular model the deep fight is supported just as easily as it was under the AOE model.

Tenet 6. Synchronization

Synchronizing in terms of combat logistical support means getting the right supplies to the right place at the right time. According to ADRP 3-0 “synchronization is the arrangement of military actions in time, space, and purpose to produce maximum relative combat power at a decisive place and time. It is the ability to execute multiple related mutually supporting tasks in different locations at the same time, producing greater effects than executing each in isolation” (Headquarters, Department of the Army 2011b, 2-14). The ability to synchronize logistical support with maneuver forces is essential as part of every plan for combat operations. The ability to synchronize logistics

with combat elements has seen no significant change from the AOE to the modular model of sustainment.

The creation of logistical bases setup during ODS were a great example of synchronizing support with maneuver forces. “The Army supported military logistics bases that stretched 600 miles from the main supply bases at the Ad Damman and Al Jubail seaports in Kuwait” (King 2008, 39). The main purpose for the creation of the logistic bases was to pre-position supplies in an effort to set the conditions for a successful land engagement. Two specific logistic bases, Charlie and Echo, each supported a corps through use of the southern main supply route (see figure 2). Understanding the key placement of logistical support nodes at the right time meant the coalition had what it needed to take the fight to the enemy.

Synchronization in a BCT under the modular concept is inherent to mission support requirements. In the process of providing logistics, the link between the BSB and the FSC forces a synchronized plan for support in order to ensure the maneuver battalion supported by that FSC has what it needs when it needs it. Although organic to the BSB, FSCs are attached to maneuver battalions as a way of supporting as far forward as possible on the battlefield. Therefore FSCs are continually tied into the maneuver battalions planning and works in detail how and when support missions are required.

Key Data Analysis Findings

As a result of the data analysis the researcher can explain the key findings as they relate to the topic as well as be able to synthesize these findings with the key literature findings in order to develop the project key findings. Based on the tenets of ULO the

researcher can find that the modular model for sustainment structure has two advantages over the AOE model.

First, flexibility exists in both the AOE and modular sustainment structures. However, the organic support relationship between the BSB and the BCT allows the modular model to be more flexible. Second, each model displays some form of integration however, the organic nature of the BSBs forces integration to a greater extent.

Synthesis of Key Analysis Findings with Key Literature Findings

The sustainment structure under the AOE model had more echelons of support for which to support combat units. Each of these commands had a single commander in charge to direct logistical planning and execution. This multiple echelon system inherently meant more coordination and the requirement for systems needed to conduct logistical operations. As was pointed out during ODS, these systems were hard to put in place. When matched with the tenets of ULO, it is clear that many aspects of the AOE model would be more than sufficient to maintain an ability to sustain forces should the U.S. Army mobilize against a near peer threat. This is especially true with regards to lethality, adaptability, depth and synchronization.

The newer modular Army design forced the sustainment structure to cut echelons of command out of the model and put more responsibility on division and brigade commanders to provide oversight for logistical planning and execution. The modular design eliminated the multiple echelons and created a system that allowed for more throughputs based logistical support. It also made the new two-level maintenance design easier to adopt since fewer levels of support were used in any theater of operations. This model, when matched up with the tenets of ULO allows for greater flexibility and

integration. The organic logistical capabilities allow for BCTs to be more flexible in their ability to maneuver around the battlefield. flexibility in terms of being able to move a combat ready force, like a BCT, with internal logistical capabilities. This eliminates any short-term requirement for logistical support from external organizations. The AOE model also forces deeper integration between the maneuver and sustainment units. An example of this would be the constant interaction between the BSB support operations officer and the BCT S4 (brigade level sustainment staff officer) representative coordinating logistical support for combat operations.

Project Key Findings

Based on the data analysis it is clear that the two different models for sustainment force structure can accomplish the mission of preparing the Army for the next engagement with a near peer threat. As pointed out however, there are some advantages of the modular model over the AOE model.

The modular model allows for greater flexibility and integration. The organic logistical capabilities allow for BCTs to be more flexible in their ability to maneuver around the battlefield. The newer modular Army design forced the sustainment structure to cut echelons of command out of the model and put more responsibility on division and brigade commanders to provide oversight for logistical planning and execution. The modular design eliminated the multiple echelons and created a system that allowed for more throughputs based logistical support. It also made the new two-level maintenance design easier to adopt since fewer levels of support were used in any theater of operations.

The AOE model required more external coordination between the maneuver and sustainment units. The sustainment structure under the AOE model had more echelons of support for which to support combat units. Each of these commands had a single commander in charge to direct logistical planning and execution. This multiple echelon system inherently meant more coordination and the requirement for systems needed to conduct logistical operations.

Conclusion

The data analysis conducted in chapter 4 answers the primary and secondary research questions through synthesis of the key literature findings and the key data findings. When measured against the tenets of ULO it is clear that the modular model has two advantages over the AOE model. Overall conclusions and recommendations with regards to this research project are discussed in chapter 5.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this research is to determine whether the sustainment force structure under the Army's new modular design is better for rapidly deploying combat power. This chapter provides conclusions and recommendations for this topic based on the research conducted. First the researcher will explain the overall conclusions of the research based on the key literature findings, key data analysis findings and the comprehensive project key findings. Next the researcher will explain recommendations based on the findings and explain what still needs to be studied as a result of this research.

The researcher will also discuss what he has learned as a result of this research. Overall the literature reviews and data analysis conducted answered the primary and secondary research questions. These techniques really allowed the researcher to understand how the Army previously operated under the AOE model.

Conclusions

The project key findings conclude that the two different models for sustainment force structure can accomplish the mission of preparing the Army for the next engagement with a near peer threat. The research also shows that there are two advantages of the modular model over the AOE model. The modular model allows for greater flexibility and integration. Due to these two distinct advantages the Army's modular force design does ensure logistical success for future combat operations.

The newer modular Army design forced the sustainment structure to cut echelons of command out of the model and put more responsibility on division and brigade commanders to provide oversight for logistical planning and execution. The modular design eliminated the multiple echelons and created a system that allowed for more throughputs based logistical support. It also made the new two-level maintenance design easier to adopt since fewer levels of support were used in any theater of operations.

The AOE model required more external coordination between the maneuver and sustainment units. The sustainment structure under the AOE model had more echelons of support for which to support combat units. This multiple echelon system inherently meant more coordination and a more robust requirement for systems needed to conduct sustainment operations. Since technology has advanced so much since the early to mid-1990s the researcher will make recommendations that relate to the study of how technology may have also increased sustainment support. This research avoided this particular topic because of the broadness of the topic and the many different directions it could lead one's research.

Recommendations

Based on the conclusion and overall findings there is really only one recommendation the researcher can make with regards to this research. The Army should continue to utilize the modular model as a way to generate combat power for strategic, operational, and tactical use. The findings in this research show that the modular sustainment construct is capable of supporting combat operations and is more rapidly deployable.

The Army should continue to refine the force structure based on past experiences as it is currently doing. Just as this research illustrated, it is critical to draw from past experiences and understand how shortfalls are rectified. It is also important to understand that facing a near peer threat is always a possibility as long as other international superpowers exist.

Areas for Further Research

Although this research answered the questions set forth in chapter 1, there are still some areas for study in an effort to ensure that the Army provides the best sustainment support possible to combat units. One such area is the evolution in technology and how the multiple in transit visibility systems have not just assisted in the rapid mobility of forces but how so many variances condense into fewer and easier to use versions.

One example of this is the Sustainment System Mission Command, formerly known as Battle Command Support and Sustainment System. This system provides in-depth ITV in addition to many other tools. However, based on the researchers experience both in a BCT and as an observer coach trainer at the Joint Readiness Training Center, units rarely utilize the system because of its complexity and requirement for extensive training. If the Army had an easier system would units use it? How much could a newer system streamline sustainment support and better support combat operations? These are just two possible research questions.

What the Researcher Learned

After commissioning in 2003 and assignment to a BCT in 2004, the researcher entered the Army just as the transformation from the AOE model to the modular model

took place. This resulted in many of my superiors, who understood the AOE model to try and force the modular model to conform to older concepts. The result was that sometimes it worked, and other times it did not.

By conducting this research, it was easier to understand how the AOE model provided sustainment support to maneuver units and where the actual changes occurred between the AOE model and the modular model. As the Army transformed from Cold War threats to more hybrid threats, it is easy to understand why the modular model became the “new” concept for organizing forces for combat operations. As a field grade logistics officer, the researcher can apply AOE concepts into modular force structure at specific levels in order to best provide sustainment support to supported units.

REFERENCE LIST

- Army Transportation Museum. n.d. Desert wars. U.S. Army Transportation Corps.
<http://www.transportation.army.mil/museum/transportation%20museum/desertstorm.htm> (accessed 1 July 2013).
- Beougher, Guy C. 2006. Improving division and brigade logistics in the modular force. *Army Logistician* 38, no. 3 (May-June): 10-14.
- Creswell, John W. 2007. *Qualitative inquiry and research design*. Thousand Oaks, CA: Sage Publications.
- Davies, Martin B. 2007. *Doing a successful research project*. New York, NY: Palgrave Macmillan.
- Fairchild, Daniel L. 1992. Operational aspects of a forward support battalion participating in operations desert shield and desert storm. Research paper, U.S. Army War College, Carlisle, PA.
- Headquarters, Department of the Army. 1995. Field Manual 100-10, *Combat service support*. Washington, DC: Government Printing Office.
- _____. 2008. Field Manual 3-0, *Operations*. Washington, DC: Government Printing Office.
- _____. 2009. Field Manual 4-0, *Sustainment*. Washington, DC: Government Printing Office.
- _____. 2010a. Field Manual 3-92, *Corps operations*. Washington, DC: Government Printing Office.
- _____. 2010b. Field Manual 4-90, *Brigade support battalion*. Washington, DC: Government Printing Office.
- _____. 2011a. Army Doctrine Publication 3-0, *Unified land operations*. Washington, DC: Government Printing Office.
- _____. 2011b. Army Doctrine Reference Publication 3-0, *Unified land operations*. Washington, DC: Government Printing Office.
- _____. 2012. Army Doctrine Publication 4-0, *Sustainment*. Washington, DC: Government Printing Office.
- Johnson, Stuart E., John E. Peters, Karin E. Kitchens, Aaron L. Martin, and Jordan R. Fischbach. 2012. *A Review of the Army's modular force structure*. Santa Monica, CA: The RAND Corporation.

- King, Kenneth E. 2008. The iron mountains of post-cold war interventions. *Army Logistician* 40, no. 2 (March-April): 38-45.
- Kugler, Richard L. 2008. Case study in Army transformation. Case study, National Defense University, Washington, DC.
- Lofgren, Joseph B. 2007. Operation Iraqi freedom and logistics transformation. Strategy research project, U.S. Army War College, Carlisle, PA.
- McCurry, Brian M. 2006. Expeditionary logistics: Dawn of a new joint logistics reality. *Army Logistician* 38, no. 5 (September-October): 4-6.
- Merriam, Sharan B. 2009. *Qualitative research a guide to design and implementation*. San Francisco, CA: John Wiley & Sons Inc.
- Pagonis, William G., and Harold E. Raugh Jr. 1991. Good logistics is combat power-the logistics sustainment of operation desert storm. *Military Review* 71, no. 9 (September): 29-39.
- Perna, Gustave F., and Joshua Salmons. 2007. Reorganizing a sustainment brigade staff for the fight. *Army Logistician* 39, no. 6 (November-December): 10-13.
- Risley, Steven W. 2006. How effective is the combat service support transformation process. Strategy research project, U.S. Army War College, Carlisle, PA.
- Stevenson, Mitchell H. 2002. Army maintenance transformation. *Army Logistician* 34, no. 5 (September-October): 6-7.